Newman's Theorem

LSE Talk on Structural Realism — 20.3.01

$\exists R(S(R))$ is a logical truth, modulo the cardinality of the domain over which the relations are defined.

Ex Consider Universe with 2 individuals a and b

Write $1 = \langle a,b\rangle$, $2 = \langle b,a\rangle$, $3 = \langle a,a\rangle$ and $4 = \langle b,b\rangle$

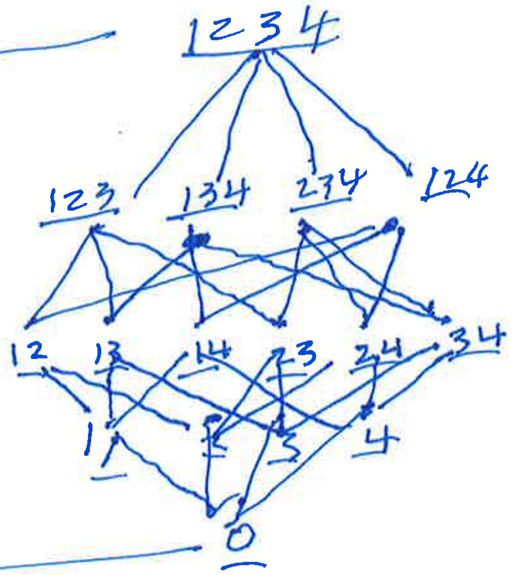
and denote $\{1,2\ldots\}$ by $12\ldots$, etc.

Then 16 binary relations are definable on $\{a, b\}$

Universal relation.

Power set Boolean algebra on 4 elements.

Void relation



Relations	Structures
1	1
4	2
6	4
4	2
1	1
16	10

Hasse Diagram showing logical connections between the relations.

(cf Carnap distinction between state descriptions, structure descriptions)

For example choose $S = \{1, 2\}$ then $S(R)$ is satisfied by 1 or 2. and so on, and this is true whatever structure S we chose, since all relations are included in the diagram.

QED.

Definition of Structure of a relation R

Equivalence class of isomorphically related relations R and R'

$R(x_1 \ldots x_n)$ iff $R'(y_1 \ldots y_n)$

where $y_1 \ldots y_n$ are images of $x_1 \ldots x_n$ under isomorphism.

Then Psillos says 2 things

1.) $S(\bar{R})$ does not refer to S of the vase is green does not refer to green!!

2) S is parasitic on $\bar{R}$

But

3) we cannot pick out $\bar{R}$ from S

Now:

4. $\bar{R}$ determines S but S does not in general determine $\bar{R}$ (unless it is the universal or the void relation)

(where $\bar{R}$ is a given relation)

So if we are only given S do we know what relation we are talking about!? $\bar{R}$? consider ex of strain or others.

So how do we pick out $\bar{R}$?

[② Reference is always inscrutable — Quine meaning only attached to language as a whole. (no such thing of universals)

③ $\bar{R}$ is an ontological posit. Reference is tied 'at the ~~edge~~ surface', so to speak, by extension a Russellian acquaintance

But How do we communicate of indeterminacy of translation?

(and incommensurability of ~~theories~~ Thesis.

① $\bar{R}$ is an ontological posit like angels or God. reference is fixed by description in terms of other relations.]

~~④ platonism~~

~~$\bar{R}$ exists even if we can never refer to it! or say what it means~~

Compare

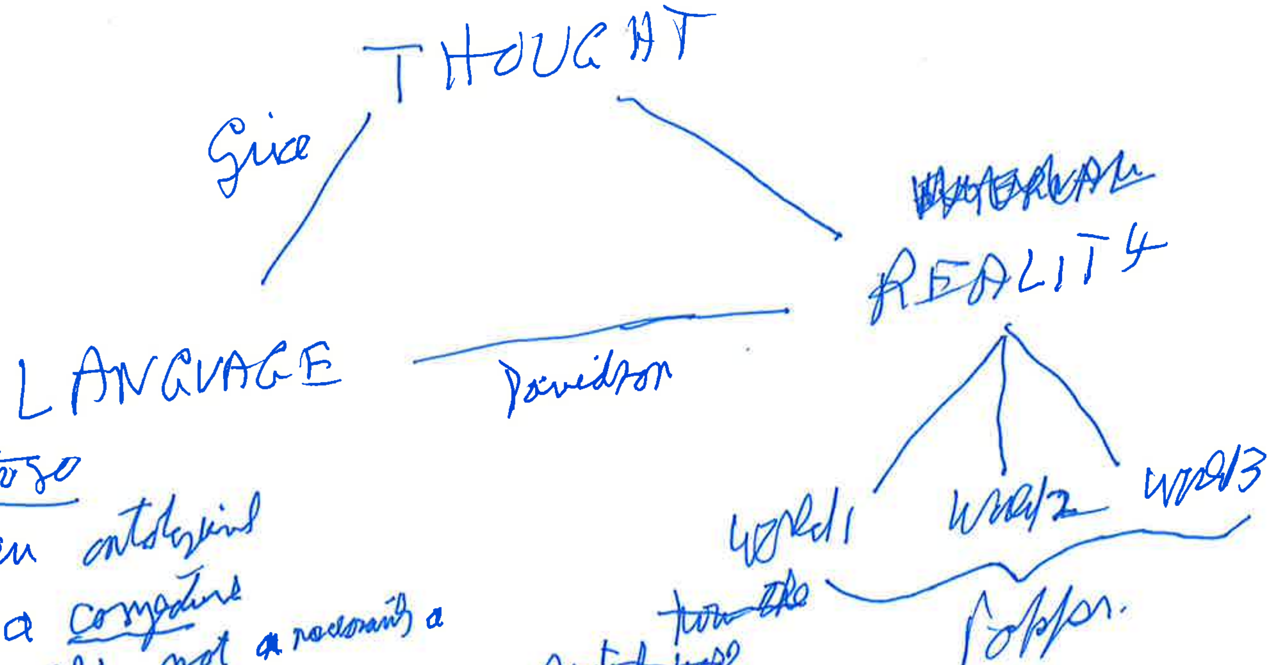
ontological structuralism

R does not exist, only S !

epistemological structuralism

R exists but we only know S.

Philosophy of Language


THOUGHT
Grice
~~NATURAL~~
REALITY
LANGUAGE
Davidson
WORLD1
WORLD2
WORLD3
Popper.

one way to go

R is an ontological posit a complete abstract world, not necessarily a true description of it, ~~[illegible]~~ a denizen of World 3 if you will ~~from the~~ ~~natural world~~

What aspect of $\bar{R}$ do we have warrant to believe ~~The~~ ~~[illegible]~~ claims that it is the structure that it satisfies

For Grice meaning is approached
through the language – thought link

For Davidson meaning is approached
via the language – reality link
via truth conditions

For Popper Reality → world 1 physical world
→ world 2 mental world
→ world 3, world of theory problem situations and conjectures

For Goodman, Quine, Rorty there is no
fixed way the world is to which language
can be latched on → holistic approach
to meaning – do we, in fact, construct worlds
rather than discover them?

cf Inscrutability of reference } Quine
Indeterminacy of translation }
Incommensurability of different theories
(Kuhn – Feyerabend)

Pre-Wittgenstein philosophy was concerned with the
Thought – Reality link

Post-Wittgenstein The linguistic turn, philosophical
puzzles attributed to linguistic confusions

Ex   a = proton
     b = electron

$\bar{R}$ { is relation — hence greater mass than — —
     { is converse relation   less mass than

Now consider new relation $\bar{\bar{R}}$ ~~of the type~~, viz

— — greater energy than —

$\bar{\bar{R}}$ has same structure as $\bar{R}$

but has different relations to other events

since energy is conserved, whereas

(rest) mass is not

Consider also relation of spin of p and spin of e

— This is the Universal relation —